Message

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Sent: 2/12/2021 1:46:38 AM
To: Hays, David C Jr CIV USARMY CENWK (USA) [David.C.Hays@usace.army.mil]; Kappelman, David [Kappelman.David@epa.gov]
Subject: HPNS RGs and MDCs

Dave and Dave –

We continue our discussion with the Navy about remediation goals for the removable fraction of any remaining radiological contamination at HPNS buildings. This afternoon we received responses to two questions about MDCs, with the Navy continuing to argue that it's impractical to measure the 1.2 dpm/100cm2 Ra-226 BPRG. I'd be interested in hearing your take on the accuracy and reasonableness of their responses. Thanks.

QUESTION #1. What are the detection limits of swipe analyzing instruments?

NAVY RESPONSE: The Parcel G Retesting Work Plan uses the Ludlum Model 3030 as a swipe counter, the same instrument that was used by CDPH at Parcel A. Count times required for various alpha MDCs using the Ludlum Model 3030P are as follows:

An MDC of 17.3 DPM/100 cm^2 requires a 1 min sample and background count time
An MDC of 3.5 DPM/100 cm^2 requires a 10 min sample and background count time
An MDC of 1.2 DPM/100 cm^2 requires a 60 min sample and background count time

Assumptions made are from the Ludlum specifications[1] as follows: background count rate of 0.3 CPM and instrument efficiency of 32% (Ra-226)

The required sample and background count times exponentially increase the lower the required MDC.

There are an estimated total of 5,500 swipes required for the Parcel G buildings, and an estimated total of 23,000 swipes required for all of the buildings at Hunters Point. Assuming a 40 hour work week for swipe processing, factoring in collection of 1 background sample for every 24 hours, would **require nearly 13 years to complete** at the 60 minute count time.

This is technically impractical, purely from the equipment detection limitations.

When measuring levels so close to zero, there will inherently be false positives caused by factors not attributable to Ra-226 contamination including: NORM in dust, instrument background fluctuations, low counting statistics, and/or equipment uncertainties. Demonstrating compliance with the proposed Ra-226 removable contamination limit of 1.2 DPM/100 cm^2 would result in an unacceptably high percentage of false positives. Statistically our goal is to achieve a 95% confidence level, which from a data standpoint, means we have confidence that the same sample would be replicated plus or minus 2 sigma from the measurement point. Contractor data from other projects at Hunters Point supports this position.
Additional MDC information may be found on *NUREG-1507 Minimum Detectable Concentrations with Typical Radiation Survey for Instruments for Various Contaminants and Field Conditions*[2]

QUESTION #2. CDPH used a 10-minute count time in their 2019 Parcel A dust sampling and achieved an MDA of 1.6 to 2.3 dpm/100cm2 with the following inputs/assumptions:

-Background Count of 30 minutes
-Background count rate of 0.26 CPM
-Sample Count Time of 10 minutes
-Instrument efficiency of 39%

NAVY RESPONSE. Using CDPH's assumptions, an MDC of 1.2 DPM/100cm^2 would be obtained using 35 minute sample and background count times. Even with an assumed increased instrument efficiency as high as CDPH's, the EPA proposed alpha removable fraction release criteria is still technically impracticable.

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